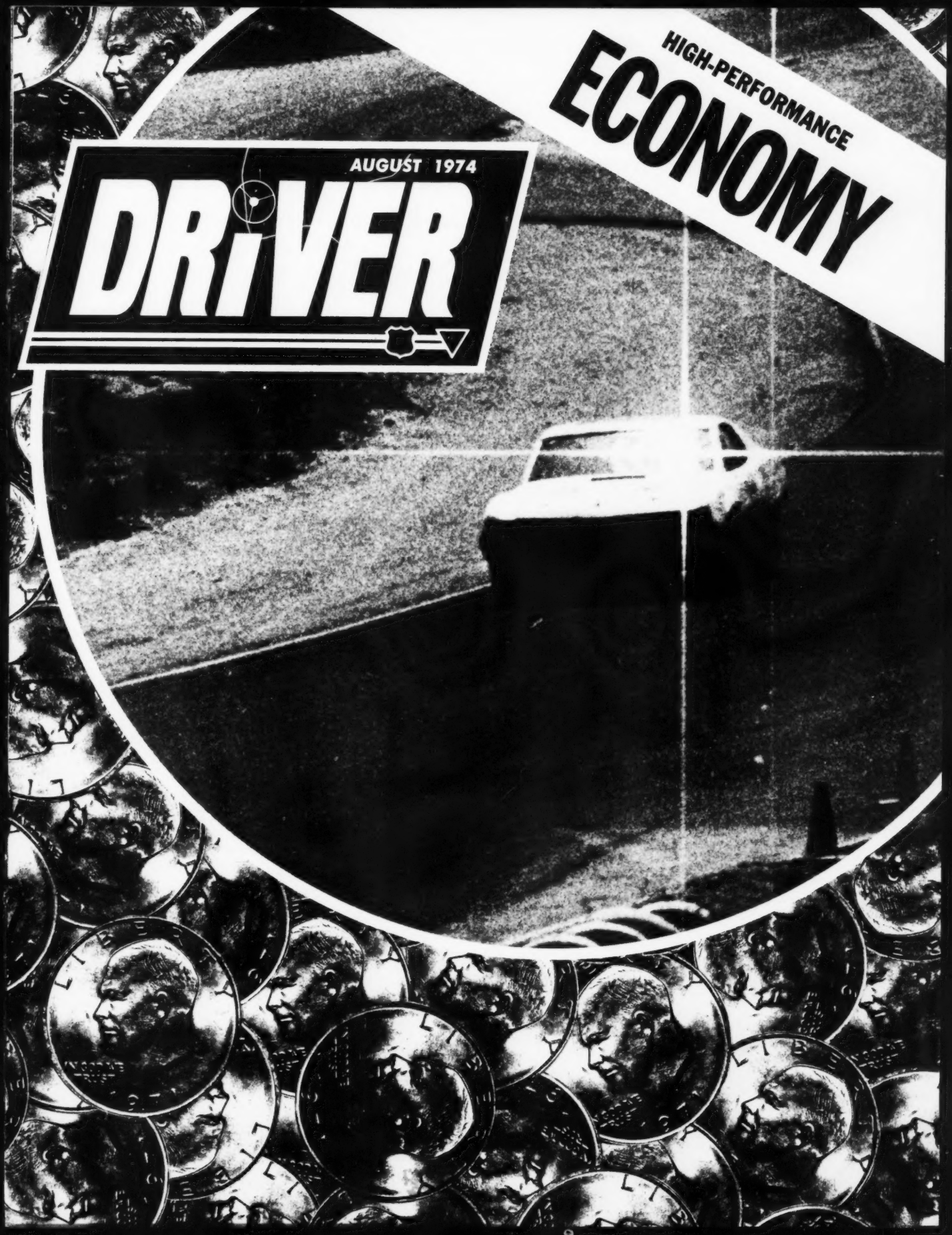
HIGH-PERFORMANCE
ECONOMY
AUGUST 1974
DRIVER

DRiVER

HIGH-PERFORMANCE

ECONOMY

(EDITOR'S PREFACE: Some fuel-saving suggestions made in this article may be economically unfeasible for your particular situation, such as buying headers or applying spoilers. But many other suggestions involve minimal expense, yet can result in substantial savings, especially when combined with conservative driving practices.)

Five laps to go. Lee dove deep into the corner. Deeper than he had dared before. He was second to an identical bright yellow car in first place that was just in sight. Lee pushed harder. The yellow car looked just a little bit larger as it disappeared around the tight hairpin.

Four laps to go. Fifty yards separate Lee from the leader. On to the long, back straightaway. The yellow car pulls away.

Three laps to go. Lee is driving to the absolute limit of the car. Tires squeal in protest through every corner. A blur of yellow slips by on the right and fades into Lee's mirrors like a billboard on the freeway. Into the next corner. The pit straight, and there's the crew. What's the pitboard say? "1 +35." First place, thirty-five seconds ahead of the next place car. That yellow blur must have been the leader!

Victory circle was crowded with friends, well-wishers, and the press. "The leader ran out of gas. How did you make it without a pit stop while everyone else had to take on additional fuel?"

"1000 RPM."

"Huh? How's that?"

"See, our engine is capable of running safely at 8000 RPM. But in our tests we found that by limiting our engine to 7000 RPM we increased our mileage by more than 2 MPG. I tried it. It worked. We won . . . and still have gas in the tank!"

You can win, too! There are lots of tricks racers use that provide them with both performance *and* mileage. Most of these are easily within your grasp. In this article, DRIVER examines some of these racing techniques that will save you gas.

WEIGHT

If you've ever looked inside a race car, you probably noticed that the car looked as though it had been stripped. Racers are very conscious of excess vehicle weight. They remove seats, insulation, carpeting, windows, everything that isn't absolutely necessary for safety. Weight slows a car down, is hard on brakes, hinders the ability to corner, and makes the engine work harder. As a result, racers go to extremes to reduce weight. They employ exotic materials such as fiberglass, magnesium, and titanium in an effort to eliminate weight.

Weight is also recognized as the primary robber of economy. By acknowledging this fact, you can save. Take a good look before you buy an economy

by

Lt LARRY RANDLETT

continued

DRIVER

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

AUGUST 1974

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CONTENTS

FEATURES PAGE

High-Performance Economy 1
Don't Knock Trains 6

DEPARTMENTS

Double Clutch 2
In The Driver's Seat 12
Getting Into It 14
What Should You Do? 19
The Backyard Mechanic 20
Backfire 26
Tuneup 29
Miss DRIVER ..... Back Cover

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THE EDITOR SPEAKS

DOUBLE CLUTCH

When I was at McChord AFB last spring, I heard about a fatal accident that has been on my mind ever since: An Air Force man was driving along a lightly traveled highway when he drifted into the opposite lane and crashed head-on into the only other car on the road.

It appeared the cause had to be fatigue or some sort of drug or alcohol-induced stupor, but no evidence could be found to support such a conclusion.

Thorough investigation turned up the true cause. The victim had had a relatively minor accident not long before. His car was repaired by a reputable body shop and apparently he thought no more about the matter. Obviously he had no idea that a ball joint had been smashed in the collision and that his car was totally unsafe.

How many of us insist on a thorough inspection of our car after an accident to insure no structural damage has been done? How many of us just assume the garage will conduct such an inspection?

Develop the habit of inspecting your car regularly. When it's on the grease rack, take a good look. If you aren't sure what you're looking for, ask a buddy who knows cars to give you some pointers. And if you are ever involved in a collision, be sure the mechanic performs a thorough inspection as part of the repair job.

NEXT MONTH
Buying a Car Abroad

Spoilers are common on race cars and exotic grand touring cars but . . .

they are also compatible with street cars. Spoilers reduce drag and increase mileage.

Race cars often use magnesium wheels to reduce weight. There are many ways you can eliminate weight on your car; alloy wheels are just one. Lower weight means more mileage.

car. The salesman may tout it as a gas-saver, but it will be easier to coax those extra miles per gallon from a car that weighs 500 pounds less. Also, reconsider all those accessories. Do you *really* need them? Each item adds that much more weight. When you total up air-conditioning, cut-pile carpeting, and extra sound-deadening material, you have added as much as 200 pounds to your car.

If you're buying a new car there are other economy devices that you should look for, and they will be discussed later. However, there are savings to be made with the family sedan. Take a look in the trunk. You have probably accumualted all manner of things, so clean it out (golf clubs can be heavy). If you rarely use your air conditioner or it has ceased working, you might consider removing it. And, for additional savings, you may want to investigate alloy wheels similar to those found on racing cars. But be careful, some "mags" weigh more than original-equipment, pressed steel wheels.

Keeping in mind that heavy cars waste gas, the next time you go TDY or PCS. travel light. You will be amazed at the improved mileage.

AERODYNAMICS

Up to 40 mph, vehicle weight is the primary factor affecting economy. Above that figure (while weight is still important), aerodynamics play a major role in delivering mileage. By aerodynamics we mean the airflow over, under, and around the car.

For performance and economy, racers pay a lot of attention to aerodynamics. In recent years you have probably noticed a proliferation of spoilers on cars, front and rear. There are two reasons for these appendages. Many of them are designed to create pressures so that there is more downforce on the suspension and increased traction. This type of spoiler is usually found only on the more exotic racing cars.

On stock cars and sports cars, spoilers are used to smooth out or "clean up" the airflow around the car. Turbulent air under and around a vehicle creates a tremendous amount of drag. This drag slows a car down, makes an engine work harder, and wastes gas. Spoilers to counteract this drag need not be very elaborate. They usually consist of sheets of aluminum or plastic placed so as to prevent flow of air under the car and around the radiator. This blocks airflow under the vehicle chassis, which is the most turbulent. Additional spoilers are often placed on the rear of a racer to force the air up as it leaves the car's surface, preventing turbulence and drag immediately behind the vehicle.

Spoilers for your car shouldn't be too difficult to make. A pair of tin snips, some sheet aluminum, and a pop-rivet gun should be all it takes. There are also several after-market firms that produce custom fiberglass spoilers for a number of different marques. They may look nicer than the one you could make, but the fancy spoiler probably won't work any better.

The amount of gas you save by using spoilers will be dependent upon how much freeway-speed driving you do, but it could be considerable.

BONUS RACER TRICK: Wash and wax your car. Racers have noted as much as 10 mph higher top speed by having a good wax job.

ENGINES

When people start talking about performance or economy, their attention is usually directed to engines. We have already seen that major gains in both performance and mileage can be made through weight reduction and aerodynamics, so now it is only natural that we look at the place where the gas goes—the engine.

Prior to any race, the pits are the scene of a great deal of activity. Most of the action centers around crews checking to make sure the engine is properly tuned. A motor out of tune delivers neither economy nor power, and you can't win races unless you have both. The same is true about your street car. A simple tune-up can bring new life to your car and improve mileage greatly.

BONUS RACER'S TRICK: Electronic ignitions will not directly increase your mileage but they will keep your engine in tune a lot longer. A tuned engine is an efficient engine.

If your engine is in tune and you still want to improve mileage, there are a number of racer's modifications available to you. The first is to limit the workload placed on your engine.

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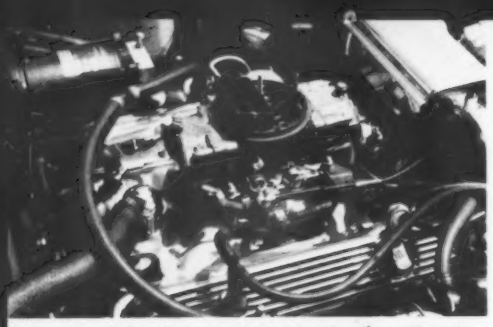
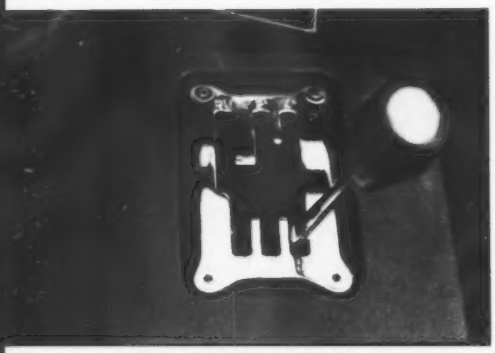


Selecting the right combination of carburetor and intake manifold can result in phenomenal increases in performance and economy.

Proper instrumentation lets you know exactly what your engine is doing. You will know when you are wasting gas.



A five-speed transmission, or an overdrive unit, reduces the amount of work an engine must do — saves gas.

Radial tires have less rolling resistance — gas savers.

This is primarily aimed at your air conditioner. When operating, the a/c will reduce mileage from 10% to 25%. (That's right, 25%!) So we find the a/c is a double villain—it increases vehicle weight *and* makes the engine work harder. The engine also turns a fan to flow air through the radiator. By using a fiberglass or aluminum fan or one that is electrically controlled through a thermostat, you will find 4 to 8 horsepower, which means the engine is that much more efficient.

If you live in a cool climate, you should consider installing a hotter thermostat in your engine. This will make your car run warmer but will also result in more complete combustion of gas and greater fuel economy.

Another way to find fuel savings is to start at the top of your engine and work your way down. Check to make sure that your air filter is clean. An engine that cannot draw enough air will result in an improper mixture of fuel and air and a loss of efficiency.

Once you have air flowing, it's time to make sure you have enough gas too. Fuel flow can be controlled through a fuel pressure regulator. You can dial-in the desired fuel pressure and assure a constant and proper flow of gas to the carburetor; none is wasted.

All this air and fuel is mixed in the carburetor and transported through the intake manifold to the combustion chambers. How efficiently this fuel-air mixture is fed to the cylinders will determine how economical your engine is. The selection of after-market carburetors and manifolds is great, but your local auto parts dealer should be able to tell you which is most efficient for your engine. In any case look for a fuel/air ratio of about 1:14 as the best compromise between performance and economy. (Make sure your manifold and carburetor can accept your anti-smog equipment.)

Once you have the proper mixture in the engine, it is just as important to get the burned gasses out of the engine efficiently. This can be done through the use of tubular steel exhaust headers and low restriction mufflers. Headers of the proper length promote the flow of gasses out of the engine and the low restriction mufflers will allow the gasses to pass easily into the atmosphere. The proper combination will give you 10% more power *and* 10% more mileage.

With your engine working efficiently, you should take a look at where the new power is going. Automatic transmissions are not nearly as economical or efficient as a four-speed standard. A four-speed is not nearly as efficient as an overdrive unit or a five-speed. It's extremely expensive to try to retrofit your car with a new transmission or overdrive unit. However, if you are in the market for a new car you can save money by taking a standard transmission rather than the expensive option of an automatic, and have a more economical car.

Another aid in saving gas can be found in the dash of your car—proper instrumentation. A good tachometer will tell you exactly how hard your engine is working at various speeds. This way, you can determine when your car is lugging and you should downshift, and when you are going too fast and should upshift. A tach can also be used with an automatic transmission to determine if it shifts at the most efficient points.

A vacuum gauge, which measures the pressure at the intake manifold, will help you to use the throttle in a most economical manner. These instruments are usually marked off not only in inches of pressure but also with a descriptive commentary: idle, poor, fair, drive, decelerate, etc. It actually tells you when you are driving economically.

WHEELS & TIRES

Wheels and tires can make a significan difference in the mileage you get. For example, your miles per gallon are affected by the type of tire you have, its diameter, its width, and its inflation.

By design, a radial tire has much less rolling resistance than a standard bias-ply tire. This means that it takes less energy to start the wheel rolling and keep it rolling. As a result, the engine doesn't have to work as hard and you save gas. A wide tire also presents more rolling resistance than a narrow tire. But here one is faced with a trade-off between low rolling resistance and cornering ability. The manufacturer's recommended tire size probably represents the best compromise between these two features.

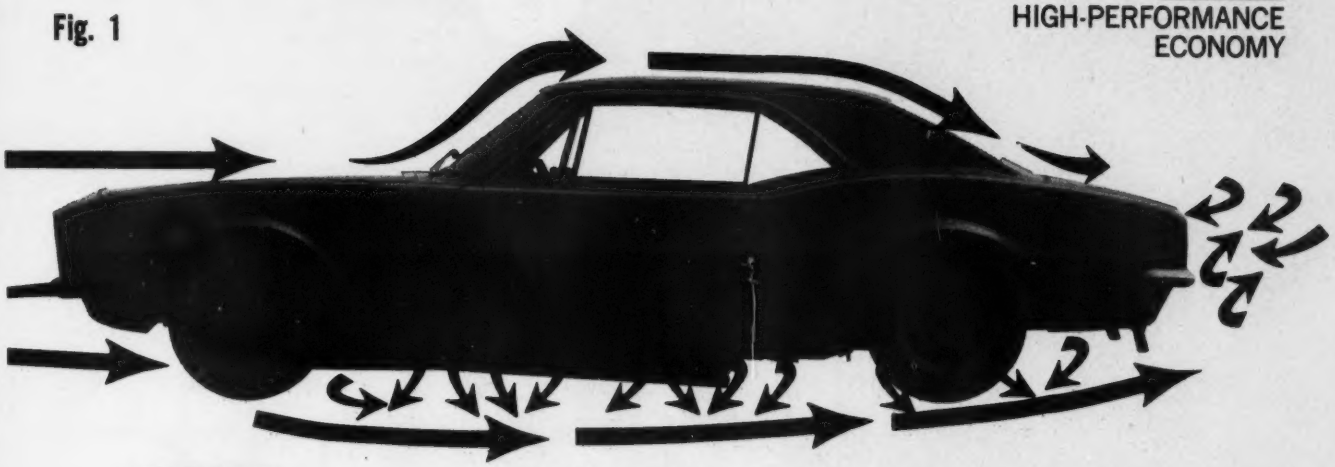
Tire diameter also affects mileage. The larger the tire diameter the fewer RPMs the engine must turn per MPH. As engine speed is reduced, miles per gallon go up. In keeping with this thought, proper tire inflation can save you as much as 2 mpg.

While you have the wheels off putting on your new large diameter radials, you might check the brakes to make sure they aren't dragging. An improperly adjusted brake makes your car work harder and wastes precious gallons of gas.

BE A WINNER

I've seen a lot of potential winners become losers as they ran out of gas within sight of the checkered flag. Don't let it happen to you. By using some of the ideas described in this article, you can increase your gas mileage significantly. The choice is yours; you can be a winner.

Fig. 1

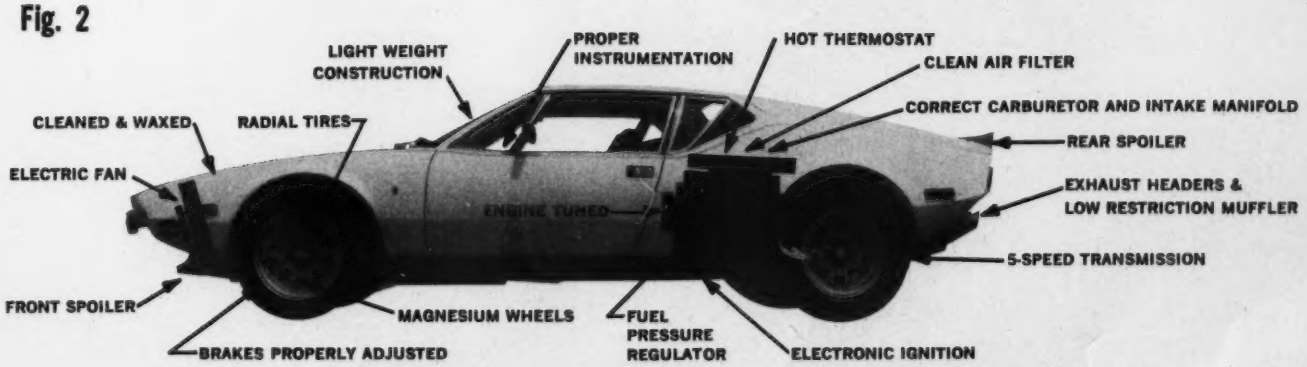


Above: **Air flow** over, under, and around a car creates turbulence which increases drag — reduces mileage.

Middle: **Placement** of front spoiler and air dams.

Below: **With spoilers** and air dams, turbulence and resultant drag are reduced, gas mileage goes up.

Fig. 2



HIGH-PERFORMANCE ECONOMY CAR

don't knock TRAINS

One of the most dangerous intersections in the world is the one where the other guy *always* has the right of way. It's called a grade crossing. That's where a highway and a railroad track cross at the same level, or grade. Some, called *active* crossings, are equipped with automatic gates which come down when a train approaches. An active crossing may be equipped with flashing lights and/or a warning bell. A *passive* crossing usually will have just a warning sign or cross buck. An *unprotected* crossing—fortunately there aren't many of these—has nothing to indicate the crossing.

Unfortunately, and tragically, some drivers don't give way to the iron horse rumbling down the track. Also, it's not uncommon for a pedestrian to become a victim at a crossing.

Most of us have enough smarts to know that a train can't stop on a dime. Whether it's a truck, bus, auto, or cycle that collides with a train, the train is going to come out the winner.

It doesn't take a lot of statistics to make you a believer, but we'll lay a couple on you to underline the point. During 1972, there were 3,379 accidents involving trains and autos. 1,260 people were killed at grade crossings. Enough for statistics. We, as drivers, should be more concerned

One of the most dangerous intersections in the world is the one where the "other guy" always has the right of way. It's called a grade crossing.

by JOSEPH STONICK

Active crossings are equipped with automatic gates and also may have flashing lights and/or a warning bell. A passive crossing usually will have just a warning sign or cross buck.

with the WHYs and HOWs . . . why they happen and how we can avoid them.

The WHYs fall into a few general categories. One is that the driver didn't SEE the train. Or he didn't HEAR the train coming. Another is that his vehicle stalled on the tracks as the train approached. Malfunctioning signal lights or crossing gates can be contributing factors. A really foolhardy category is the one wherein a driver tries to beat the odds, believing he can make it across the tracks before the train gets there. There's not much that can be done about the last category—suicide.

There are many additional questions under the WHYs. For example: Why can't some people see a train coming down the tracks? Dummy-type question? Maybe not. What if there's a heavy fog or other condition that limits visibility?

Why can't a driver hear a train's warning whistle? Loud conversation with fellow passenger(s), radio or

continued

After a train passes, don't take off until you can see far enough down the track to make certain that another train is not coming on another track.

stereo blaring . . . Take this case. Would you believe a guy was wearing a stereo headset when a train hit his car?

Why does a driver try to beat a train to a crossing? You no doubt have just as good an answer as we have.

We could go on with the WHYs, but we should get on to the HOWs. We all know the answers; they're strictly common sense. But it's usually a good idea to help ourselves to a fresh look.

The following advice comes from the men who should be considered authorities on the subject—the railroaders:

- Slow down when you see a railroad advance warning sign, and be prepared to stop if a train is approaching.
- Stop for flashing lights at a crossing.
- Never pass other cars which are waiting at a crossing.
- Do not drive around the gates.
- After a train passes, don't take off until you can see far enough down the track in both directions to make certain that another train is not coming on another track.
- Never move onto the tracks while the flashing lights are still operating.
- Don't ignore crossing signs just because you're in familiar territory and think you know the train schedules by heart.
- Be extra alert when visibility is limited by weather, or when you are driving in unfamiliar territory or on slippery roads.
- Be super-cautious at night—don't overdrive your headlamps and slam into the side of a train.
- Don't become so distracted by conversation with passengers that you ignore signs, lights, horns, bells, and all other warning devices.
- Be especially attentive to signs when you have the air conditioning and radio going because they may keep you from hearing the train whistle or warning bells.
- If you get caught on the tracks, in a line of traffic when a train is approaching, abandon your car at once. No car is worth your life.
- Never drive onto a railroad crossing unless you are absolutely sure there is room for you to clear the tracks.

CAR TROUBLES

If your luck runs out, your car may quit cold in the middle of a railroad crossing. If this happens, the name of the game is "Get Out and Run!" And be sure to run in the direction of the oncoming train so that you won't be struck by flying debris when the engine junks your car.

Under very special circumstances and conditions, you might—just might—have a chance to save your car.

If you cannot see a train coming, and if you can see a long way down the track in both directions, there *may be a chance* of getting your car out of danger.

continued

Most of us know that a train can't stop on a dime. In a collision with a motor vehicle, the train always comes out the winner.

3445
3445
Santa Fe

If your car quits cold in the middle of a railroad crossing, the name of the game is "Get Out and Run!" Be sure to run in the direction of the oncoming train so you don't get hit by flying debris.

continued

DON'T KNOCK TRAINS

Post lookouts to keep an eye in both directions, and then try using the starter to move your car.

This trick will work if your car has a manual transmission: put the transmission in low or reverse and hit the starter key.

If your car has an automatic transmission, put it in Neutral, and try pushing the car off the tracks.

If you have the slightest doubt about accomplishing either job safely —forget it. Abandon the car! It is better to lose your car than your life.

A good point passed on to us by a pro truck driver is that you should never attempt to shift gears while your car is crossing the tracks. The engine can stall at slow speeds, while pulling the car over the bumpy rails, if you downshift while it is under a heavy load.

If your car has a manual transmission, downshift before you get to the tracks, and *do not* change gears while you are on the tracks.

An automatic transmission will take care of its own gear changing, according to the load on the engine. Just to be doubly safe, however, you could slip it down into L1, or a comparable gear, before you get onto the tracks and leave it there until you are safely across. Then shift back up to Drive and go on your way.

The preceeding suggestions point out what YOU can do to avoid a grade-crossing accident. Other people are working continuously on the problems at crossings, and a lot is being accomplished toward alleviating the dangers.

One area of study is focused on better identification of a locomotive approaching a grade crossing. Recent innovations include the installation of strobe lights on top of locomotives to act as an *alert* signal for the driver of a vehicle approaching a crossing. These lights are similar to those on emergency vehicles. Also, marker lights, like those used on semi-trailer rigs, are installed around the periphery of the locomotive to help the motorist *identify* the locomotive for what it is. This system of lighting is currently used on the Bangor and Aroostook RR Line, in northern Maine, and will be installed on locomotives in several other lines in the near future.

Other improvements, now in the research and development stage, include flashing strobe light systems for use at grade crossings. Studies of new types of crossing gates and other innovative concepts are currently in the industry-procurement stage.

Early this year, John W. Ingram, Federal Railroad Administrator, announced that a series of locomotive-auto crash tests would be conducted at the Department of Transportation's High Speed Ground Test Center at Pueblo, Colorado. Mr. Ingram said that the series of four impact tests will provide baseline data for reference in evaluating possible changes in the design of rail equipment and highway vehicles, to improve crash-worthiness. The tests, held in February and March, were conducted on a special "impact track" at the Test Center. A locomotive fitted with an automatic control system approached at about 50 miles per hour immediately prior to impact with automobiles which were equipped with standard safety devices.

For the last two of the four tests, 13 high-speed cameras were positioned on the ground, the locomotive, and the automobiles to record visual parameters of the test during and after impact. Instrumented anthropomorphic dummies in the automobiles allowed for evaluation of forces and trajectories that would be applied to

Research-and-Development testing is a part of a continuing Department of Transportation program aimed at reducing injuries and deaths from collisions at rail-highway crossings. During 1972, there were 3,379 train-auto accidents.

In two locomotive-auto crash tests conducted at the DOT's High-Speed Ground Test Center, instrumented anthropomorphic dummies in the automobiles allowed for evaluation of forces and trajectories that would be applied to a human driver in such a crash.

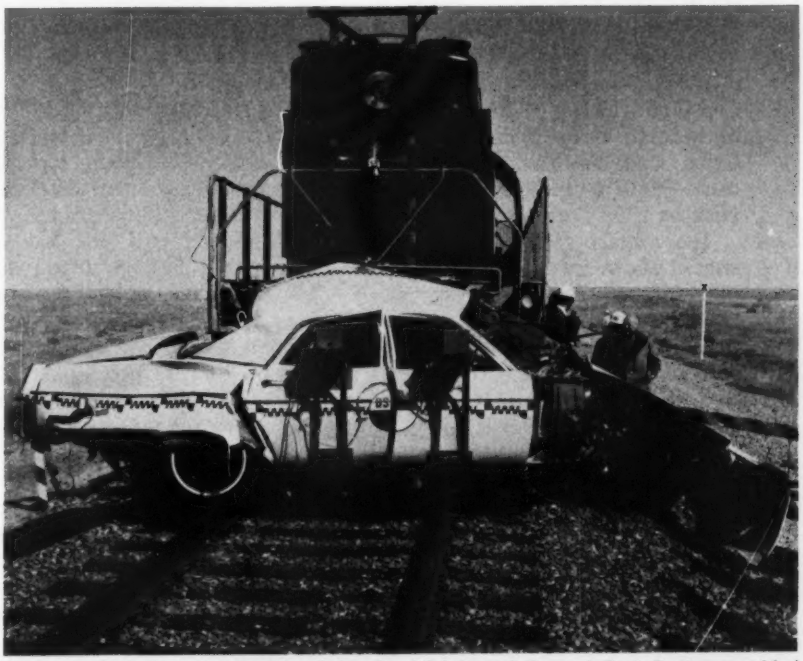
a human driver in such a crash. In each of these vehicles, 40 transducers were installed to transmit pertinent data.

The purpose of these tests was to acquire data that might suggest design changes to lessen the impact and severity of grade-crossing accidents.

In Washington, D.C., the Association of American Railroads, representing all the railroads, conducts its own research and development program. Also, the individual railroads conduct research and development programs, and continually test new safety devices and systems.

One of the goals of continuing research and development programs is to avoid a static condition wherein safety devices and equipment remain at a standstill. Technological improvements will help insure that, 20 years from now, safety devices will be current with the times. But all the advanced technology applied won't help YOU, the driver, if you fail to take advantage of it. When it comes to crossing railroad tracks, YOU are still the key to how safely it can be done.

The thing to remember is—when you are approaching a grade crossing, if there is ANY doubt as to whether or not a train is approaching . . . STOP . . LOOK . . AND LISTEN.



Tests conducted at the Pueblo, Colorado, High-Speed Ground Test Center provided baseline data for reference in evaluating possible changes in the design of rail equipment and highway vehicles, to improve crash-worthiness.

SSgt Peter Karabis

SSgt Nick Karabis

An involvement with speedy machines is a big part of the lives of two midwest brothers, Pete and Nick Karabis of Madison, Wisconsin. Both are Air National Guard F102A crew chiefs at Truax Field in Madison. Besides this, they are both race drivers participating in an average of 12 wheel-to-wheel competitions each year.

The Karabis brothers are members of the 100-member Madison Sports Car Club which is affiliated with the Midwestern Council of Sports Car Clubs. Both brothers drive 1600 cc cars—Pete's is a 1972 Ford Pinto; Nick's a 1968 Cortina GT.

The average race day field consists of about 160 cars ranging from old McLarens, Corvettes, and Mustangs, to Formula Fords, Formula Vees, and six different classes of sedans, along with the sport racing categories. The 1.7 mile course has seven corners and two dog legs.

The brothers report they have been finishing well in the races, although they have won only a few first places —a worthy record after only 2 years racing experience. But they did win a first and second place in a 250 participant Rod and Custom Show in Madison. This was the first time race cars had ever been entered with other show cars, and included a safety preparation category.

Pete told us that safety is foremost in the minds of all competition participants. Required driver protective gear includes Nomex fire-retardant suits and gloves, and Snell-approved helmets. All cars must have roll bars, front and real window-glass restraints (in case of roll over), three-inch lap and shoulder harness, fire extinguisher, an ignition kill switch, catch cans for oil breathers, transmission, rearend, and water overflow. Corner workers are at all events, as are crash and fire crews.

With all this, plus the skilled and cautious driving of the Karabis brothers, we have no doubt they will go far in racing competition. DRIVER wishes them the best of luck.

Ed Note: DRIVER has always been your magaine. But you, the reader, can make it even more your mag. Here's how. There's a lot going on out there that we don't know about—but you do. So we're doing this thing called "In the DRIVER's Seat." Its purpose—for you to let us and everyone else know what's happening.

If you've done something unique in the way of autosports, safety or in any area of interest to DRIVER readers, or know someone who has, let us know. We'd like to put one of you "in the DRIVER's seat" every month. Send your nominations for "In the DRIVER's Seat" to Editor, DRIVER Magazine, AFISC/SEDD, Norton AFB CA 92409.

IN THE DRIVER'S SEAT

Nick and Pete Karabis—brothers, race drivers, National Guard F102A crew chiefs, rally drivers, and driving enthusiasts share the "In the DRIVER's Seat" spotlight for August.

Although they drive different type cars in the races, both brothers own 1966 Mustang 2+2 GTs which they enter in their auto club's rallys.

WATER

EMERGENCIES

WIND

A motorcycle traveling at a relatively high rate of speed on a smooth road with no wind is a remarkably stable vehicle. In fact, the centered weight and spinning wheels of a balanced motorcycle make it very much like a gyroscope. But *anything* that even slightly disrupts the balance of a motorcycle makes it very unstable. This "anything" can be a slight bump in the road, a bit of sand or water on the pavement, or a slight headwind. And as you probably realize by now, a bump or some loose gravel on the road that isn't even noticed in a car can put you on your head on a bike. So since we road riders are never riding under ideal conditions, to make it on the road we have to be prepared to handle the "unusual" conditions.

As a motorcycle rider, the first thing you have to be concerned with is the surface you are riding over or about to ride over. A motorcycle reacts to every surface. Even the normal surface has cracks, bumps, debris, and loose material. The smooth, dry, paved surface has a crown (higher in the middle), dips, bumps, and it is banked on turns.

DIFFERENT SURFACES

The best bet is to go around any road obstacle whenever possible. But if you can't, the following tips for riding over some of the different surfaces you may encounter should be helpful.

Sand, mud, and water generally create difficulty in steering and balance. You will have to use more power than normal to keep the rear wheel turning so you can ride through these materials without bogging. Don't let up or try to brake in these materials—your bike is most stable when powering through loose material.

Riding on materials such as gravel, dirt, and rocks is a lot like riding over marbles. Treat these surfaces carefully—keep the rear wheel turning, but accelerate and brake slowly and gradually. Loose materials also increase your stopping distance as much as a wet surface.

Pavement irregularities are another problem. The experienced rider tries to avoid bumps, cracks, and holes whenever possible. If you must travel over or through them, do so slowly and evenly. Do not change speed or direction abruptly when going over a bump or hole. Try to cross the obstruction at a favorable angle—that means crossing at an angle wide enough to decrease the chance of a spill; about a 90-degree angle is

Part V

GETTING INTO IT

Based on information from *The Beginning Rider Course* Copyright 1974 by Motorcycle Safety Foundation.

usually best. You cannot always cross at a good angle, but do not swerve abruptly or leave your lane of traffic to miss a bump. Your chances are better when you brake as much as possible before the bump and then go right over it.

WEATHER

There can be no doubt that the motorcyclist is more seriously affected by adverse weather conditions than any other motorist. Wind, rain, and cold all present problems for the road rider.

Wind affects the cyclist's speed, stability and ability to maneuver. A strong headwind can drastically lower a cycle's speed (this is especially true of the smaller machines), putting its cruising speed below that of the rest of the traffic. You can help this problem by tucking in—lowering your upper body down over the gas tank.

A strong headwind can also affect a cycle's stability. If a bike tends to go into a "speed wobble" or become unstable at high speeds, the sudden increase in air speed (from 55 to 75 mph, for instance) could cause a loss of control. When heading into wind gusts, you should slow down, tuck in and tighten your grip on the bars.

Tailwinds can also be dangerous. A 20 or 30 mph tailwind can substantially increase a cycle's speed without the rider knowing it—a dangerous situation when entering a curve. Always keep a close watch on your speedometer—especially when you suspect a tailwind.

Crosswinds are probably the most dangerous wind. Whether you realize it or not, you compensate for a crosswind by leaning into it—the greater the crosswind, the greater the lean. If the crosswind is suddenly eliminated, for example, by riding behind a row of houses or a solid fence, you may find yourself leaning on nothing. The same situation holds true in reverse. If you pull out from behind a sheltered area and are suddenly smacked with a 30 mph crosswind you can easily lose it. The only solution for dealing with crosswinds is to anticipate them. A smart rider must read the signs—leaves and dust blowing across the road, the branches of trees bent in one direction—and be ready.

Cold obviously affects you more seriously on a bike than it does in a car. When it is cool your reactions and body movements are slowed down. And in really cold weather you can be afflicted by hypothermia. This is a condition where your body temperature is lowered below the normal temperature, drastically affecting your ability to react and function on a bike. So in cold weather, stop frequently to warm up, and keep your speed well within your capabilities.

continued

RAIN

The greatest single weather factor in cycle accidents is rain. Rain combines the worst aspects of wind and cold with decreased visibility, effectiveness of eye protection, and traction. Riding without eye protection in the rain is nearly impossible. But glasses, goggles and face shields also lose their effectiveness in the rain—they tend to steam up and the water on the lenses distorts vision. It's a good idea to treat your shields with anti-fogging compound to help prevent this problem.

The worst time for riding in rain is just after the first few drops have come down. When just a little water mixes with dirt and oil on the road, traction can be cut dramatically. Your best bet is to try and sit out a quick rain shower. Just pulling over and letting a summer shower blow over makes life a little easier.

Riding in the rain is generally okay if you take a few precautions. First wait about five or ten minutes for the rain to wash the majority of the oil from the road surface. You should wear gloves for protection, but if you feel you do not have positive brake lever, clutch lever, or throttle control—take them off. Also, if you are going to have to ride in the rain very long, you should be wearing a bright-colored rain suit and full boots. But don't try to ride in an ordinary, floppy-type rain coat or slicker—it's very easy for the loose ends to find their way into the spokes.

When riding on rain-slick roads, stay away from the painted lines. Simple roadway markings may be extra slick when wet. The same holds true for railroad tracks, bridge gratings, and expansion joints. These are hazardous under all conditions, but are especially slick when wet. Tracks, expansion joints, and bridge gratings should be crossed slowly, at right angles and with the cycle as near vertical as possible. Manhole covers should be avoided whenever possible.

One rain-riding trick many cycle riders use is to ride in the tracks made by other cars or trucks. If you are following a car and there will be

SKIDS

SURFACES

DRIVER

semi-dry tracks on the road where the car's tires clear the water off the road—stay in them.

SKIDS

Skidding is one of the most frightening experiences a motorcycle rider can have. A motorcycle skid is sudden, and it can be violent. But if you do skid while riding on wet pavement you've got a good chance of saving it.

Here are some of the techniques you may be able to use to control a wet skid.

- Keep the front wheel pointed straight and apply slight power.
- Above all keep your wheels rolling true. Overbraking is one of the most common causes of a skid. This is why it is a good idea to go easy on your front brake when slowing on wet pavement. If your skid is caused by overbraking—let up on your brakes. If your skid is caused by over-acceleration—back off your throttle. Above all try to keep true contact between your tires and the surface you are riding on. A locked or spinning-without-traction wheel creates very little control.
- Use your feet to straighten up. Usually, in a mild, low-speed skid, you can avoid a spill by using your feet to keep your cycle upright. Using your feet to prevent a fall is tricky and should be done *only* if everything else has failed. Preventing a skid is the best advice of all. If you are not sure what the road is like, slow down AHEAD of time.

CARRYING A PASSENGER

Another common situation that can create problems is carrying a passenger. The first thing most new riders want to do is take a friend for a ride. But you shouldn't try hauling anybody or anything until you have a bit of riding experience. Carrying a passenger will alter your balance and make riding a bit trickier. If you carry a passenger the bike must have a dual seat or a separate passenger seat and rear footpegs. Your passenger should straddle the seat (never ride sidesaddle) and keep his balance by holding onto your waist.

You should have your passenger keep his body in line with yours and ride in a relaxed position. And have the passenger either remain straight up or lean with you when you corner. But be sure you know what he's going to do so you can adjust for the change in balance. You don't want your passenger all of a sudden leaning into a corner when you're leaned in—this can be enough to cause you to ground a pipe on the frame.

Finally, be aware of the effect the extra weight of the passenger will have on the acceleration and braking of the cycle. The added weight will put an extra stress on the engine and drive chain, and radically reduce acceleration rates. The extra weight will also increase braking distances, and you may have to pump some more air into the tires to get the right amount of tread on the road. These effecs are more pronounced on the smaller machines.

EMERGENCIES

Besides the "normal" riding problems we've discussed so far there are a few true emergency situations that you're liable to encounter on a bike. While many of these can be avoided by proper maintenance and smart riding, it's a good idea to know what to do in these basic situations.

Having an animal chase you or run in front of you when you're riding is pretty common—but can be almost an emergency in many cases. By letting an animal distract you, you can do unnecessary things like run off the road or into cars. The main thing is to watch for dogs in residential neigh-

continued

borhoods and slow down—let the dog make his move and then you can probably accelerate around him if the road is clear. Never try to kick at an animal—this may throw you off balance and might make the dog mad—most dogs just like to chase the noise and aren't really after a piece of you.

Having a stuck throttle or broken cable is definitely an emergency. While proper maintenance should prevent this problem, if it does happen simply hit your kill switch or turn the ignition key off and apply both brakes. Riders who get into trouble in these situations sometimes are so surprised that they fail to do anything. Killing the engine is a smart move in most any type of emergency—just don't slow down too fast in heavy traffic.

A blown tire is another cycle failure that can turn into trouble quickly. If you have a tire blow out, do not use your brakes. Just ease off the throttle and slow gradually. When your speed is low enough, move off the road SLOWLY. There is no good way to control a cycle with a flat tire, but a firmer grip of the handlebars helps.

Wet brakes can be a problem, so anytime you ride through water you should check to see if the brakes still work. After clearing the water, check traffic to your rear. When there is room, apply light braking pressure. If your cycle responds you still have braking power.

In an all-out emergency on the road you may have to either brake or change lanes quickly. Brakes on modern motorcycles have a tremendous amount of braking power when they are used properly. To get the most braking from a motorcycle in an emergency, both brakes must be used together. Never try to use maximum braking power in a turn. Always make sure your cycle is in an upright position and going in a straight line before using your maximum brake power. The INSTANT you feel either wheel slipping or your cycle starts to slide sideways. LET UP ON YOUR BRAKING PRESSURE. Remember, to prevent an all-out skid—keep your wheels moving.

Sometime, someplace, you may have to get out of a tight situation by making a quick lane change. To make the quickest lane change possible, you will have to use a technique called "out-tracking." It works this way. In an emergency, the quickest way to get your motorcycle to turn is to steer *away* from the turn first. Once your cycle starts to out-track, counter steer, that is steer back into the turn you are going to make. "Out-tracking" is complicated. You should practice this maneuver until you get a good feel for it and can use it for making quick maneuvers.

One situation you'll probably face fairly regularly on the road is going into a corner too hot. There is no completely correct approach to this situation. It depends on how fast you are going, how tight the turn is, how much traction you have, and how much farther you have to go before the curve starts. The most important thing to keep in mind is this: You need to reduce your speed as much as possible BEFORE you get into the curve. If you can, apply maximum braking before you begin leaning for the curve. If you are already into the curve, you may be able to straighten up for just an instant, so that you can apply some hard braking before you lean into the curve again. Above all, keep working at it.

By now you should know one thing. The real secret to successful riding over different situations is this—prepare for them in advance. If you have to ride at night or in the rain, prepare for the trip. If you are smart and prepare for these riding situations in advance, you will seldom, if ever, have to make an emergency maneuver.

PASSENGERS

WHAT SHOULD YOU DO?

You're driving 50 miles an hour on a country two-lane highway and you come upon a deer about 200 feet ahead standing beside the road. What should you do?

A. Sound horn, hard brake, and ease off to medium brake to stop and proceed cautiously.

B. Medium brake to slow down to 40 miles per hour to pass.

C. Medium brake to swerve right behind the deer if he moves.

(See answer on page 28)

THE BACKYARD MECHANIC

FINAL TUNING

Last month's "Backyard Mechanic" went through the basic tuneup steps of inspecting essential components and installing new ignition parts. However, we didn't get into the most important part of a general tuneup—the final adjustments. So this month we'll finish things off by outlining how to use the special tuneup equipment to make the final tune settings.

The main items you'll need for putting a super-tune on an engine are a dwellmeter, preferably a combination tach/dwell, and a timing light. This equipment is available at your base auto shop. But if you're really into "backyard mechanicing," you can pick up the necessary equipment at a discount store for around $25 and have your own home tuneup center.

Many stores carry special tuneup kits that contain the essential equipment. But, while these kits are handy, most of the less expensive ones come with the weak-flashing neon bulb timing light which is relatively inaccurate and very difficult to use. The brighter-flashing power timing light is the only way to go as we'll explain later. So if you buy a complete tune-up kit be sure it has a power timing light—either A.C.- or D.C.-powered is okay, but the D.C. is handier. You might also consider buying the tune-up items individually since most discount and department stores regularly place tuneup equipment on sale. By watching the newspaper ads you can probably pick up a good-quality timing light and tach/dwell for about what you'd pay for a kit containing less accurate instruments.

DWELL

The first step in final-tuning an engine is setting the dwell angle—this is basically just a more precise measurement of the point gap. By reading how long the points stay closed before opening (with the engine running), a dwellmeter tells exactly what the point gap is and allows for a more exact adjustment.

Some people think that if the points are set carefully with a feeler gauge there's no reason to check the dwell. But this isn't true, as evidenced by the very existence of the dwellmeter. Generally if the points are set to specs with a gauge they'll be pretty close on the dwell—but not always. So checking the points with a dwellmeter should be part of every tuneup.

To use the dwellmeter all you have to do is attach one of the meter's leads at the coil and ground the other lead. Trace the wire that runs from the distributor to the coil. Clip the positive dwell lead (red clamp) to this terminal. If the terminal is covered with a special insulator boot, you won't be able to get a direct connection. In this case pull the boot up slightly and wrap one end of a straightened paper clip around the terminal and push the boot back down. Then clamp onto the free end of the clip to make your connection (see picture). Make sure the lead is not touching any other metal, then simply ground the other lead.

Next set the meter to dwell if it is a combination tach/dwell and flip

One lead of the dwellmeter hooks to the positive coil terminal. If the terminal is covered with an insulator boot, lift the boot slightly and wrap one end of a straightened paper cilp around the terminal. Then clamp onto the paper clip.

Before testing the engine, set the meter to either tach or dwell and to six or eight cylinder—whichever settings are appropriate. For a four-cylinder engine mentally double the eight cylinder reading.

the switch to either six or eight cylinder—whichever is appropriate (see picture). If you are testing a four-cylinder engine, set the selector on eight cylinder and mentally double the reading. After getting the meter hooked up and properly set, check a manual for the dwell spec on your engine. The dwell specification may be given as a single value or in the form of an acceptable range. For instance, the acceptable dwell might be given as 36° to 40°. In this case the best bet is to shoot for the middle of the range.

To check the dwell simply start the engine and take the reading—make sure the idle is reasonably close to the proper speed to insure a correct dwell reading. If the dwell angle is not to specs, the points need to be readjusted. Too high a dwell means the points are staying closed too long—the gap needs to be widened. A low dwell reading means the points are not staying closed long enough—the gap needs to be narrowed. The easiest way to remember this is that if the dwell is too small the points should be made smaller.

Setting the dwell on a G.M. product with the external point adjustment is a snap. Simply insert the allen wrench into the adjusting nut and turn it until the dwell is right on. If the dwell is high, turn the nut clockwise to open the points. If the dwell is low, go counter-clockwise to close the points.

Adjusting the dwell on a non-G.M. distributor can be a pain since it's more of a trial-and-error procedure of adjusting the points until the correct dwell is obtained. However, with a helper you can cut out a lot of hassle. Remove the distributor cap and rotor and have your helper crank over the engine just long enough to get a reading on the meter. Then make the appropriate point gap adjustment—high reading wider gap, low reading narrower gap—and have him crank the engine again so you can check the new setting. Continue this procedure until you get an acceptable reading. Doing this prevents having

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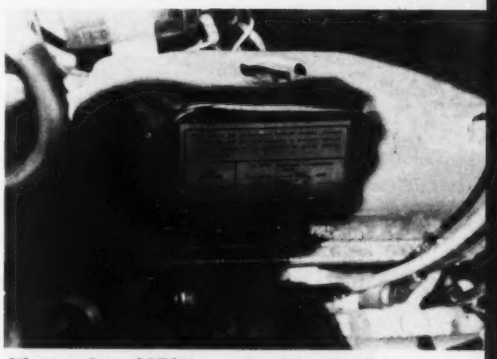


All cars since 1971 have the vital specifications contained on a special information plate in the engine compartment.

to adjust the points, reinstall the rotor and cap, and start the engine after each adjustment to check the dwell. You can also work this system by yourself with a remote starter switch.

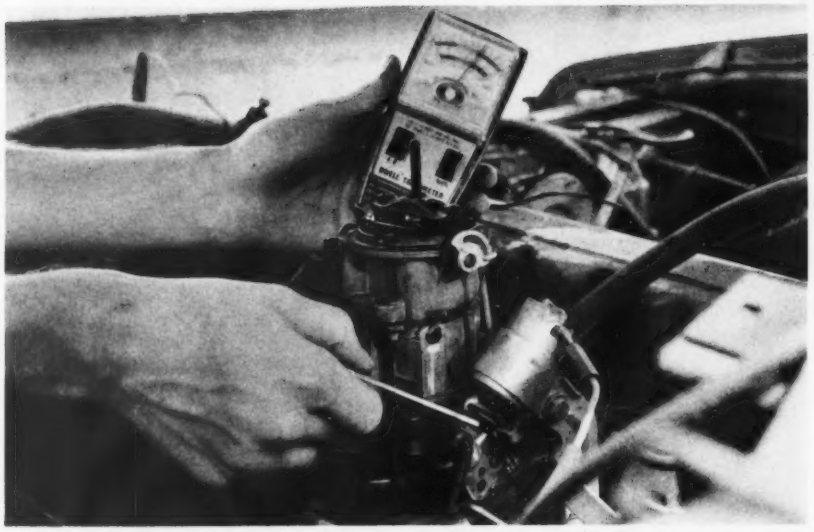
DWELL HOLD

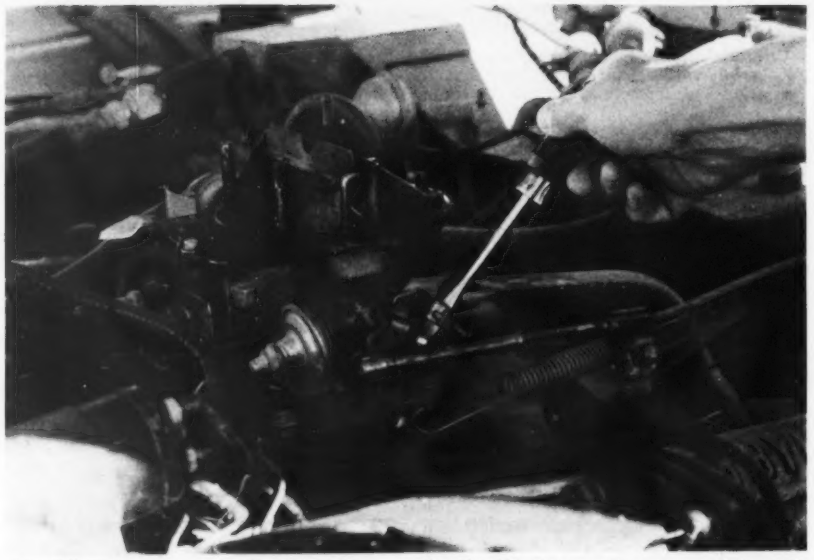
After getting the dwell right on, you should perform a dwell hold test to check for a worn distributor. To do this simply increase engine speed slowly as you watch the dwell reading. If the reading increases more than 3 degrees as you increase idle speed to about 1500 rpm, the distributor is worn and should be replaced or thoroughly checked out by a mechanic. Also, if there is more than a slight variation in the dwell at idle, or if the points won't hold adjustment, you can be pretty sure the distributor is worn.

CARBURETION

The next step in a final tune is setting the carburetor. On post-1971 cars all you really have to worry about is the idle speed. All 1971 and newer cars have the idle mixture preset at the factory and a special limiter cap installed over the adjusting screw. This cap prevents the screw from being turned more than one-half turn to help keep the engine operating within emission standards. It is strictly illegal to remove or tamper with this screw.

So on a newer car, locate the limiter cap(s) at the base of the carburetor and simply check to see that it is turned out as far as it will go. Locate the idle set screw at the throttle linkage or anti-dieseling solenoid and you're ready to set the idle. But you don't just adjust the screw until the idle is at the right speed on today's cars. Most newer cars require rather exotic methods of setting the idle speed. For instance, some cars have to have the idle set while they are idling in gear with the headlights and all accessories on. Always check a manual or the information plate in the engine compartment (see picture) for the correct idle speed and adjustment procedures.





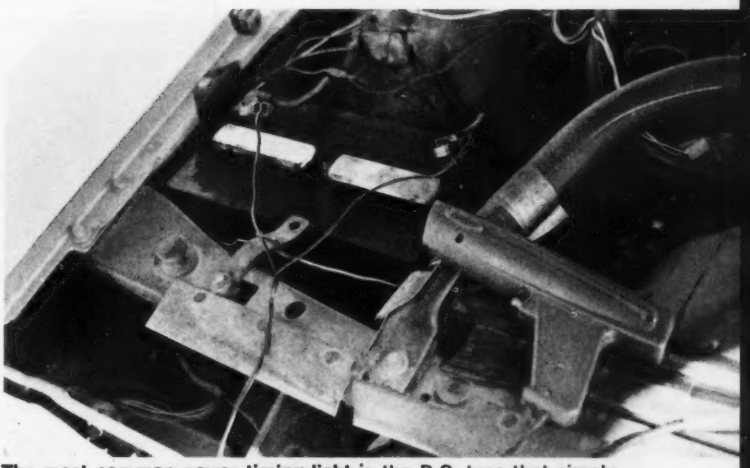
Hot idle speed is set at the solenoid or on the throttle linkage. Be sure to follow all specs and special procedures when setting idle.

On cars newer than '71 the idle mixture does not require adjustment—the mixture is preset at the factory and special limiter caps placed over the adjusting screws. On older cars an acceptable mixture setting can be obtained using a tachometer (see text).

A couple of other points to remember are to be sure the engine is fully warm and off the fast idle cam when adjusting the curb idle. Also—if the idle is set with the air cleaner off—double check it with the cleaner unit in place. Finally, never try to smooth out the idle by turning the speed up—a higher idle just wastes gas and contributes to dieseling.

On a pre-1971 car you will probably need to set the idle mixture as well as the idle speed. A fairly good idle mixture setting can be made using the tachometer. Locate the mixture screw(s) at the base of the carb—one-barrel carbs have one mixture screw while two- and four-barrel carbs have two mixture screws. Turn the screw in until the idle roughens, then turn the screw out slowly until the highest possible tach reading is obtained. If there are two idle screws, repeat the procedure on the second screw. You may need to turn the idle speed down before adjusting the second screw as the engine may race when the first mixture is reset. With the mixture set, simply set the idle to the correct speed following the procedure shown in the manual. Once again be sure the engine is fully warmed and double-check the speed after installing the air cleaner.

The power timing light emits a very bright flash and is more accurate and easier to use than the simple neon bulb light.



The most common power timing light is the D.C. type that simply attaches to the car battery. Hook the red lead to the positive battery terminal and the black lead to the negative terminal.

TIMING

After setting the idle you're ready to make the final and most important adjustment—the ignition timing. A lot of people neglect timing because they think it is an involved job. Timing is critical on today's cars and should be set very carefully at every tuneup. But timing an engine is really very simple if you avoid the common mistakes of many backyard mechanics.

First of all, the neon bulb timing light is very difficult to use and barely adequate. These weak, flashing lights can be used only in a dark garage and then must be held right next to the timing marks. And on a lot of cars—newer cars especially—getting the light this close to the marks is a hassle and can be very dangerous

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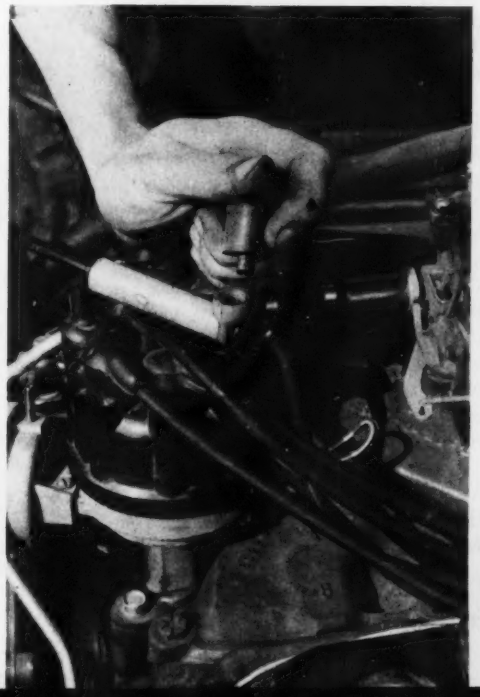


The third lead of the D.C. light simply inserts into the number one plug wire pick-up at the distributor cap. The plug wire is installed in the top of the connector to complete the circuit.

since you risk getting the light's leads or your hands caught in the fan. So if you don't have a power light, your best bet is heading for the hobby shop and using a good light. You'll get a more accurate setting with a lot less trouble.

Hooking up a power timing light is quite simple. An A.C.-powered light (this type is pretty rare anymore) simply plugs into a standard household electrical outlet. The more common D.C.-powered light has two leads that connect to the battery. Attach the red lead to the positive battery terminal and the black lead to the negative terminal. Both type lights have a third lead that has a special connector that inserts into the number one cylinder plug wire pickup on the distributor cap.

A manual shows the location of the number one cylinder pickup at the distributor cap. On an in-line engine you can locate the number one plug insert by simply tracing the plug wire from the first cylinder to the distributor cap. On a V-eight engine the number one cylinder may be either the first cylinder on the right or left bank—you'll have to check your manual.

After locating the number one plug wire, pull the plug wire out of the cap and install the timing light connector. Then reinstall the plug wire into the top of the connector (see picture).

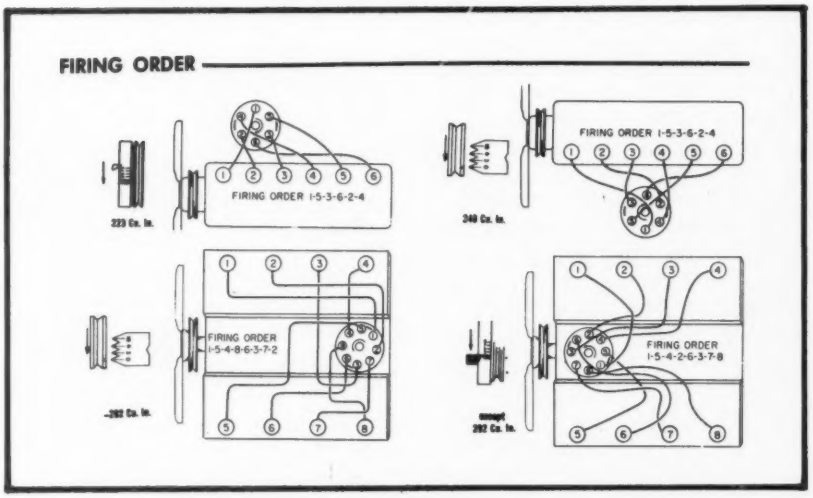
The type and location of the timing marks varies considerably. However, most manuals have a diagram or a picture showing exactly what the marks look like and where they are located. So if you check a manual you shouldn't have any trouble finding the marks. But you may need to rotate the engine by hand or by tapping the starter until the marks become visible. Also, you'll probably have to clean the grease and grime off the marks with solvent so you can see them better.

The timing marks are generally located on the lower front pulley or on the vibration damper (below the fan). There is usually a stationary timing pointer on the engine block and a series of timing marks on the pulley. But on some engines there is one mark on the pulley and the timing marks are stationary. Generally there will be a mark for TDC (top dead center) and a series of marks to the right of TDC indicating degrees before TDC and marks to the left indicating degrees after TDC. Most cars time before TDC so the marks to the right of the TDC line are what you will be concerned with.

After locating and cleaning the marks, very carefully make a neat line with white chalk or white enamel paint over the correct timing mark (given in your manual). This will help you see the mark when the engine is running.

Start the engine and let it warm. The engine must be fully warmed and idling at the proper speed to set the timing. While the engine warms, check the manual or the information sticker to see if there are any special procedures for timing. Nearly all engines must be timed with the vacuum advance line removed at the distributor and plugged. The best way to plug the line is by attaching a vacuum gauge or inserting a golf tee in the end of the line.

With the engine warm and idling at the correct speed and the advance line plugged, aim the light carefully



Check a manual for the type and location of the timing marks used on your car's engine—this varies greatly. Mark the correct timing lines with white chalk or paint to help make them visible.

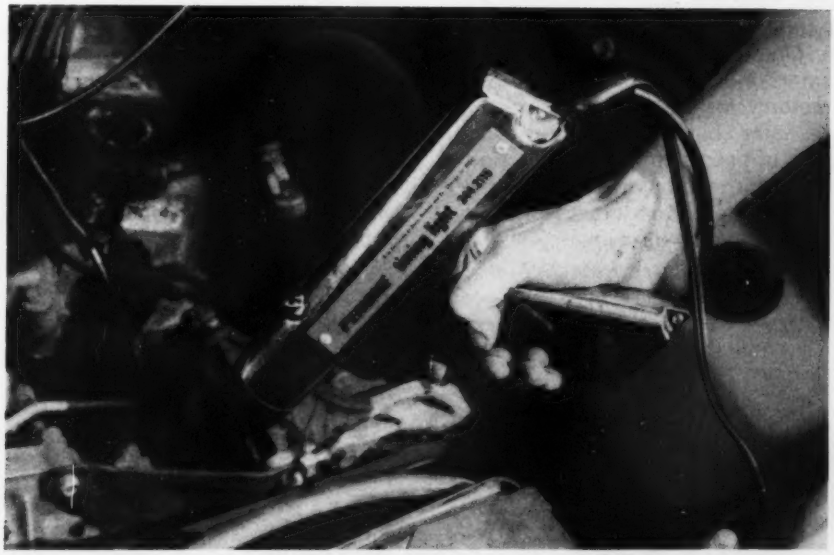
at the timing marks. Not aiming the light properly is one of the primary causes of timing error—so be sure to keep the light at about a 45° angle and sight directly down the light.

The timing light will flash each time the number one cylinder fires and make the timing marks appear to stand still. The mark and timing pointer will align on each flash if the engine is in time. If they don't line up, you will have to adjust the timing by rotating the distributor. To do this you first have to loosen the clamp bolt that holds the distributor in place. On most older engines the bolt is easy to get to. However, on many newer engines the bolt is located behind the distributor and you may need a special distributor wrench or a swivel attachment on a ratchet extension to get to the bolt.

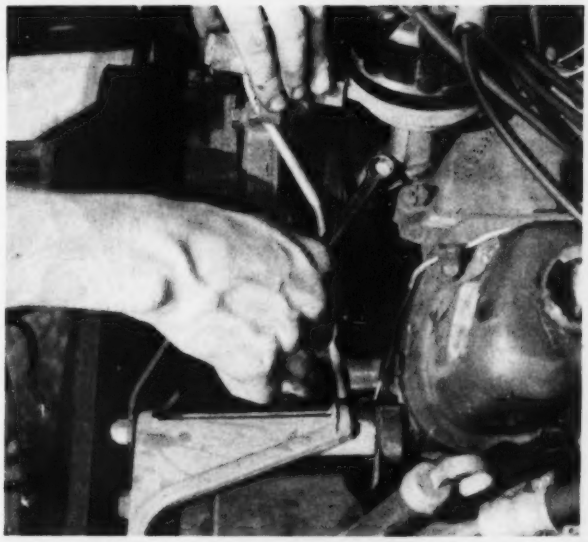
To adjust the timing, simply rotate the distributor slowly until the timing mark and pointer align. Then carefully lock down the clamp bolt and double check the setting to be sure it didn't change when the distributor was tightened.

With the timing set you can test the mechanical advance by gradually increasing engine speed while aiming the timing light at the marks. If the advance is working, the timing mark will jump ahead. On older cars you can also check the vacuum advance by reinstalling the vacuum line at the distributor. The timing mark should jump ahead slightly. On most cars since 1971 there is little or no vacuum advance at low speeds so you can't check the vacuum advance in this manner.

Now you're finally done. But go back and quickly double-check everything again just to be sure you've got the engine super-tuned for max performance and gas mileage. You might also consider going to a dyno tune shop to have your car's engine scoped and dynoed. For a modest price (around $10) you can be doubly sure everything is working right and that your engine is super-tuned.



Before timing the engine, remove the vacuum advance line at the distributor and plug it with a golf tee or a vacuum gauge. Then with the engine idling, aim the light carefully at the marks, keeping it at about a 45° angle. Not aiming the light carefully is one of the major causes of timing error.



If the timing is off, simply loosen distributor lock bolt and rotate distributor until the marks line up—then the engine is timed.

BACKFIRE

PEOPLE OR MACHINES?

In reply to a letter written to DRIVER and printed in the May issue concerning motorcycles—I am appalled at the narrowmindedness reflected in Mr. Joseph's letter.

Pro motorcycles or con, there is no changing the fact that they are here to stay due to their economy. Doesn't the savings in gasoline reflect concern for the environment? I think so.

Motorcycles need to become safer? Hogwash!! Drivers of both motorcycles and cars may need to be safer, but to attribute the failings of people to machines is ridiculous. When the time comes that automobile drivers react reflexively in a situation involving cycles, as most have learned to do in driving situations involving cars, then the roads will be safer for all.

Why not work on methods to make things safer for all, instead of categorizing motorcycle drivers as rude and uncaring? I ride my husband's motorcycle frequently. I know that it is more dangerous for me to ride the cycle than drive our car, but I feel this is due not to my own carelessness or rudeness but to the fact that many drivers of automobiles don't see me or else they don't know how to react. Let's learn to drive defensively and politely, whether it is in a car or motorcycle.

Millie Carter Fisher
105 Ft. Macon Drive
Havelock, NC 28532

As Dr. James B. Gregory of the Department of Transportation told us in a recent interview, actions we take in the physical sciences to improve vehicles are only "defensive" things. The big job is in the social sciences, where we have to change attitudes and improve technical competency through better training methods. But that's hard. It's easier to add safety features to the vehicle, so that's what we keep doing instead of facing the real problems.

IT WON'T HURT A BIT!

Until your May article, "How Accurate Is Your Speedometer?" ended with the sentence, "Unlike the dentist's six-month check-up, it takes only a few minutes and it doesn't hurt a bit," I was enjoying DRIVER as I have for the past six years.

Please, before you use such similes, consider the Air Force dentist and his civilian counterpart, and consider that you are strengthening the age-old fear of the dentist by using such words.

AFM 30-3, Vol II-K, requires the active-duty military member to have an annual dental examination; these usually fall in the member's birth month, involve visual and radiographic examination of the teeth, supporting structures (gum, bone), and soft tissues of the mouth.

Such examinations usually take only several minutes, are painless, and are intended as the same sort of preventive maintenance that DRIVER stresses for vehicles. True, the examination may reveal conditions to be treated but, assuming that such annual inspecting has been done regularly for the patient, treatment is usually of a minimal nature with minimal discomfort. . . .

Maj Paul W. Otto, Jr.
Dental Clinic
Hurlburt AFB, FL 32542

PEDALING ALONG

Good article—"Pedaling Along"—in the May issue. Even an old commuter-by-bike like me learned a couple of pointers. BUT that child's seat pictured on page 6 is a dangerous contraption with no guard between the youngster's feet and the rear wheel spokes. Seats with guards (plastic or metal) are available; surprised you didn't show one of them. (I know of a baby who lost his leg in the rear wheel—heartbreaking.)

And the last paragraph of the article: Even though most locks are no good against the well-prepared thief, they do discourage the passer-by who might be tempted. It's like taking your keys and locking the doors when you park your car.

Capt George Hutchinson
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We agree on both points. Thanks to all of you readers who wrote in about our very poor choice of a child's seat. Guards for the child's feet are absolutely essential.

MORE PEDALING

I was very pleased with the article on bicycling in the May issue. The International Orange, color-coded and reflective pennant flags are a definite asset to the visibility of the cyclist. The described mounting staff is also suitable.

On my way home from work this evening, I noticed two bicyclists riding along on the nearby sidewalk. These youngsters had the pennants on a rod about 4-feet high. The prevailing winds caused the flag rods to sway over 35° toward each side, in the pattern of a metronome. Because cyclists ride side by side (or pass one another in opposite directions or pass by pedestrians as their "mood winds move them") the extreme sway of the flagstaffs can present a hazard to neighboring cyclists and pedestrians. Consideration should be given to minimizing the sway to about 20°. Tips of the staffs should be covered with a ball-shaped fitting, preferably of hard rubber.

SSgt Martin T. Lyon
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The sway of the pole is affected by the size of the banner. Oversize flags should not be substituted for the stock pennants. Pedestrians will not be threatened by flagstaffs if bikers remember they must **walk** *not ride their bikes in pedestrian pathways or on sidewalks.*

AW, SHUCKS . . .

A word of warm appreciation for the great job you and the staff of DRIVER have done during the past year or so. The content and presentation are right on target. The overall superior product is one of which you have every reason to be proud. I read the magazine with pleasure every time it passes my sight and there's always lots of good stuff between the cover pages. Keep charging—it's a darn fine job.

W. J. Aston
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BETTER DISTRIBUTION

I received the May DRIVER—another great issue. SMSgt Caldwell's letter about receiving his November issue in March was also true in my case. However, that same week I received December and January, and then during the next couple of weeks February, March and April came in almost together. So apparently the problem (of personal subscriptions) has been cleared up.

I enjoyed the Flying Angel story, but the article by Larry Johnson ("Behind the Handlebars") was excellent. I'm very active in cycling here in Mississippi and belong to several clubs . . . Our clubs have tried for years to promote and encourage safe, quiet, and responsible operation of motorcycles. I disagree with Mr. Joseph's statement in Backfire that "most motorcycle riders don't give a tinkers damn for the feelings and property of others." Quite the contrary; our clubs go out of their way to respect people and property.

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Yellow Turn Signals Required in Spain

If you've received orders assigning you to Spain, and are importing a vehicle, there's something you should know. A new ruling requires your vehicle to have yellow rear turn indicators before it can be driven in Spain.

Many foreign cars in the U.S. are already so equipped, making it easier for other drivers to anticipate the intended actions of that vehicle's driver. And in Europe, most all cars have the yellow lights. But with U.S. cars it's a different story.

You can pay to have your vehicle converted to yellow turn signals, but it's not hard to do it yourself. Instructions are available by writing the Torrejon Air Base (Spain) Information Office requesting copies of the two June 1974 editions of the base newspaper which describe the procedure in easy-to-understand language. The address is: 401 TFW/OI, APO New York 09283.

Make Haste Sanely

An interesting experiment in Europe points up the folly of "passing every car on the road."

Two identical cars, fitted with instruments which registered every driving detail, made a test run of almost 1,000 miles from Hamburg to Rimini on the Italian coast. More than half the distance was over expressway-type routes.

One driver was told to make the best time he could, to pass when it was safe, and to take bends at maximum possible speed. The second was told to take it easy, to avoid any risk, and to move as the traffic flow permitted.

Result: After almost 1,000 miles, the speed demon finished only 31 minutes ahead of the relaxed driver. Taking every advantage, he averaged less than 50 mph. He was behind the wheel 20 hours and 12 minutes and used his brakes 1,339 times, including four emergency stops. He passed 2,004 other cars and was passed by only 13.

The slower driver braked 652 times—with no emergency stops, passed 645 times, and was passed 142 times. His driving time was 20 hours, 43 minutes. Experienced drivers from West Germany's biggest motoring club were skeptical and tried a test of their own—an 800-mile run from Cologne to the Brenner Pass.

In this test, the fast car took 16 hours, 52 minutes; the slow took 21 minutes longer.

In both tests, besides risking his life and endangering others, the fast driver paid a penalty of about 10 more gallons of gasoline, plus obvious wear on his brakes, tires, suspension and engine.

—from The American Way

About Miss DRIVER

(See back cover)

"Be especially careful at intersections!" warns our August Miss DRIVER, Judy Rowley. Her brother was seriously injured when an older motorist violated his right-of-way at an intersection and that accident has made a lasting impression on her. Judy is a nurse's aid and part-time model, likes to cook and dance. Her ambition is to become a recognized professional model, and also to appear in TV commercials.

"Answer to What Should You Do?"

(See page 19 before reading)

At 50 mph it is going to take you at least 188 feet to stop, and that leaves only about 12 feet to take care of misjudgment, so you wouldn't want to try a panic stop. Also, if you medium brake to slow down to 40 mph to pass, you might as well stay at 50. If the deer jumps out in front of you, you'll hit him, and you could lose control of the car. Trying to swerve behind the deer is a loser, too. There's no way of knowing which way he'll move, and he can be quick as a flash when he wants to be. Swerving to miss a deer is the biggest cause of car-deer accidents. Your best bet is answer A: Sound horn, hard brake, ease off to medium brake, stop, then proceed cautiously. Your horn might scare him off the road, or back into the woods. Always remember, however, if you see one deer, there is usually another in the immediate area, so be prepared for two of them.

DRIVER and the Paper Shortage

You may have heard rumors about a paper shortage. Well, they're true, and the shortage will affect us all, particularly us magazine types. Here's how the picture looks for DRIVER.

This issue is approximately two weeks late. The reason—no paper at the printer. The company supplying paper to DRIVER's printer is having problems meeting the demand of his customers due to the shortage, so his shipment was about two weeks behind.

Another change is in the quality of our paper. It's thinner, and more yellow. The reason—that's all that was available to satisfy the large paper demand of our 225,000 copy press run.

What the future will bring is hard to say. But we ask for your understanding and cooperation in adjusting to the changes in the production of our magazine.

☆U.S. GOVERNMENT PRINTING OFFICE: 1974—789-876/12

TUNEUP
pet peeve

My "PET PEEVE" is the driver who engages his directionals when there is another intersection before the one where he intends to turn.

SSgt Richard S. Colbeth
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McGuire AFB, New Jersey 08641

MISS DRIVER

"How long has it been since you read your owner's manual? If you're like most drivers, you know exactly where it is—at the bottom of the glove compartment under some old maps, leaky packages of drive-in salt, and a couple of sticks of chewing gum. Why not set aside a few minutes to spend with your manual and be amazed at what you learn? In addition to lists of safety checks, you'll probably find tips about what to do in emergency situations, how to tow your car properly, how to drive in mud, how to deal with that mysterious emission control, and much, much more. The plot may not be so exciting, but there's a lot of good reading in your Owner's Manual."

JUDY ROWLEY